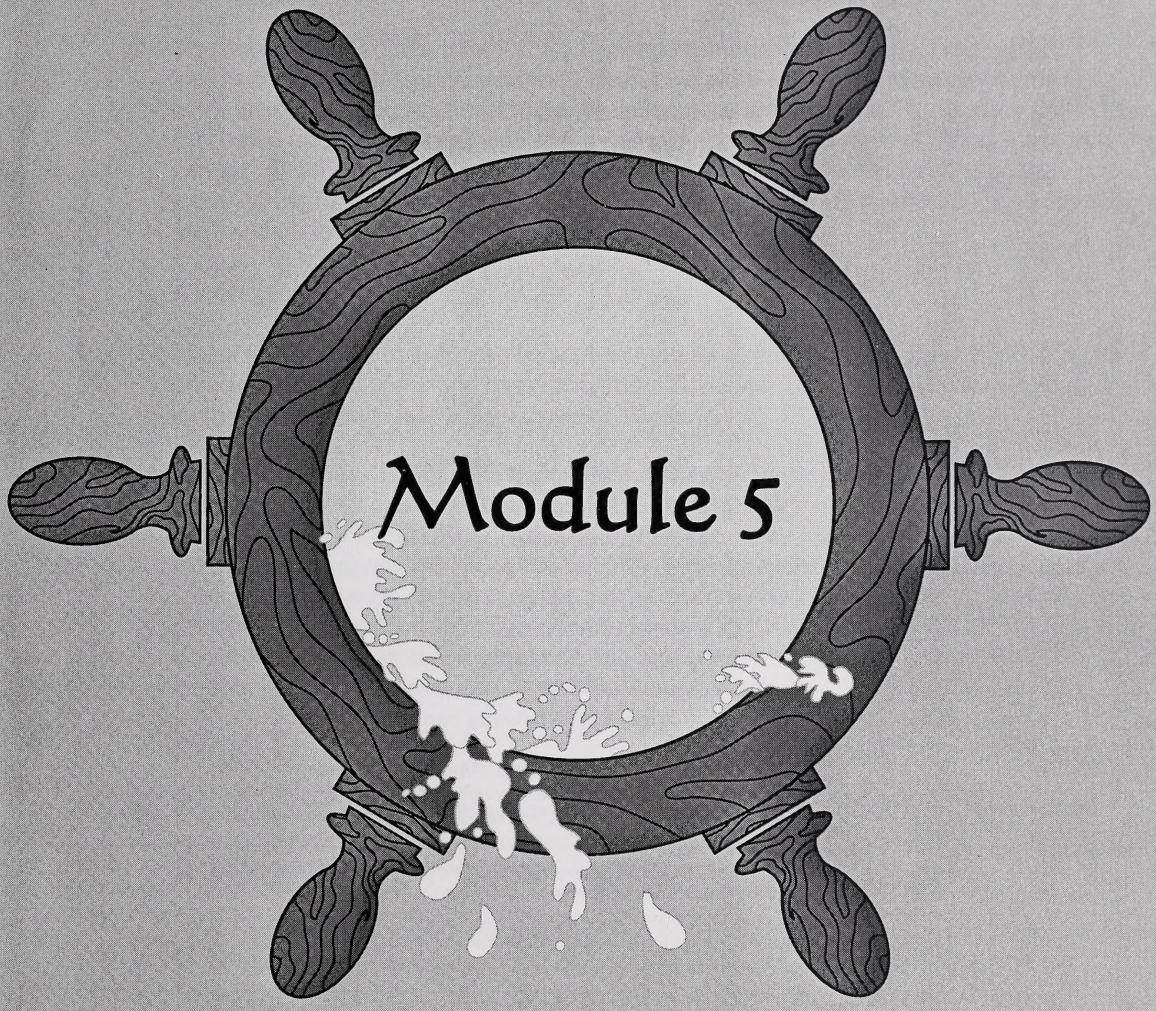
Mathematics 5



Home Instructor's Guide and Assignment Booklet 5A

Learning Technologies Branch

Alberta LEARNING

Mathematics 5
Module 5: Data Analysis
Home Instructor's Guide and Assignment Booklet 5A
Learning Technologies Branch
ISBN 0-7741-2038-x

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

Module 5: Data Analysis

Overview

The activities in Module 5 review and extend methods for collecting, recording, organizing, displaying, and analysing data. Line plots and broken-line graphs are introduced and used to show different relationships among data. The student learns the difference between a population and a sample and how a sample is useful when you cannot collect all the data you want to examine. Data is collected by conducting experiments to answer questions. The student sees that it is important to organize and display data in ways that best solve his or her problems.

Assessment

At the end of each of the three lessons in Module 5, the student is directed to complete an assignment in one of the two Assignment Booklets. The assignments will be graded by the teacher and have a total value of 90 marks.

Students are also expected to complete the Numbers in the News project. This project has a value of 10 marks. Encourage the student to look through a newspaper at least once a week for items on the Scavenger Hunt list. Read through the list with your student and suggest that he or she begin collecting samples of the ideas that he or she already understands. Other samples can be collected as ideas are introduced or extended in the module. Encourage your student to collect as many samples as he or she wishes. At the end of the module, the student will need to choose at least one sample for each question and submit the samples with the Assignment Booklet.

Pacing

The module has been designed so that students can work at their own pace. Each lesson, including the lesson assignment, will take the average student about one week to complete. The Challenge Activity in each lesson is optional.

Allowing extra time for review of basic facts and project work, Module 5 will take students 3 to 4 weeks to complete.

Lesson 1: Recording and Displaying Data

Overview

In this lesson the student sees how a particular collection of data can be recorded and displayed in many ways to show different relationships among the data. The student learns how to make frequency diagrams, line plots, and broken-line graphs and when it is useful to do so. Problems will be solved by using these methods and by analysing graphs.

Special Requirements

You may gather the following materials for your student to use in this lesson:

- ruler

Sharing Time

Students are asked to discuss what they are learning twice in Lesson 1—at the end of Activity 2 and at the end of Activity 3.

These Sharing Time exercises are open-ended, so answers will vary. However, sample responses are given.

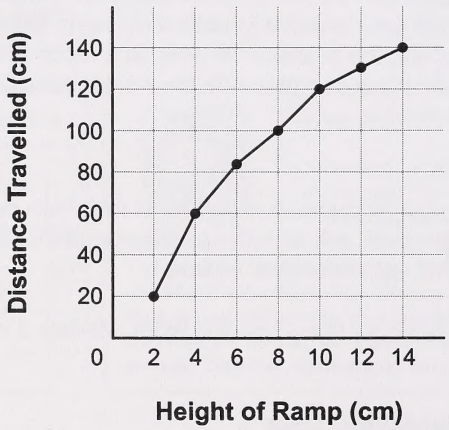
Activity 2 Sharing Time

1. **a.** A quarter of the class said they could draw 50 stars in one minute. This number of stars was reported more often than any other number of stars.

   b. More than one-half of the class could draw 50 more stars in one minute.

Activity 3 Sharing Time

1.



2. The higher the ramp is, the farther the toy car will roll. When you increase the height of the ramp from 2 cm to 4 cm, the car will roll 3 times as far.

Lesson 2: Selecting a Sample

Overview

In Lesson 2 the student sees the need to choose a sample when it is not possible to collect all the desired data. The student collects and uses data from samples to solve problems and answer questions.

Special Requirements

You may gather the following materials for your student to use in this lesson:

- 4.54-kg bag of Canada No. 1 table potatoes
- measuring tape
- kitchen scale
- Alberta road map
- sample of Canadian coins (pennies, nickles, dimes, and quarters)

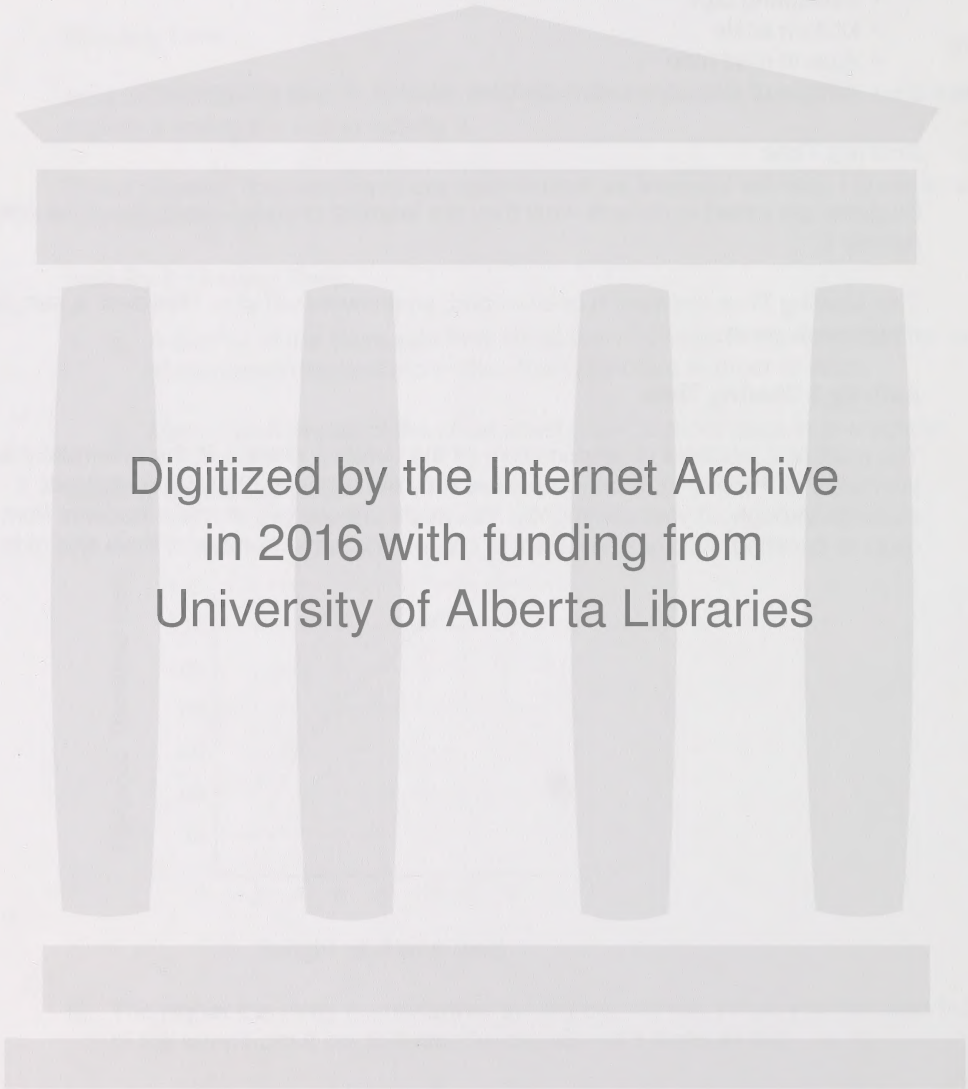
Sharing Time

Students are asked to discuss what they are learning once in Lesson 2—at the end of Activity 2.

This Sharing Time exercise is open-ended, so answers will vary. However, a sample response is given.

Activity 2 Sharing Time

You must pick students at random from all the Grade 5 classes in the community as your sample. Picking from only one class may not represent the views of Grade 5 students throughout your community. You might choose two or three students from each class to question. Also, you will want to choose the same number of boys and girls.



ASSIGNMENT BOOKLET 5A

Mathematics 5

Module 5: Lesson 1 Assignment and Lesson 2 Assignment

Home Instructor's and Student's Comments:

STUDENT FILE NUMBER
(if label is missing or incorrect)

_____

Date Submitted:

_____

Apply Module Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and module.

FOR SCHOOL USE ONLY

Assigned Teacher:

_____

Date Assignment Received:

_____

Grading:

_____

Teacher's Comments

_____

Teacher's Signature

Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.

INSTRUCTIONS FOR SENDING IN THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you register for distance learning courses, you are expected to send in Assignment Booklets for corrections regularly. Try to send each Assignment Booklet as soon as you have completed it. Before sending your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to be sure the spelling and details are correct?
- Is the record form filled out and the correct module label attached?

MAILING

1. Postage Regulations

Do **not** enclose letters with Assignment Booklets.

Send all letters in a separate envelope.

2. Postage Rates

Take your Assignment Booklet to the post office and have it weighed. Attach enough postage and seal the envelope. Assignment Booklets will travel faster if correct postage is used and if they are in large envelopes that are no more than two centimetres thick.

FAXING

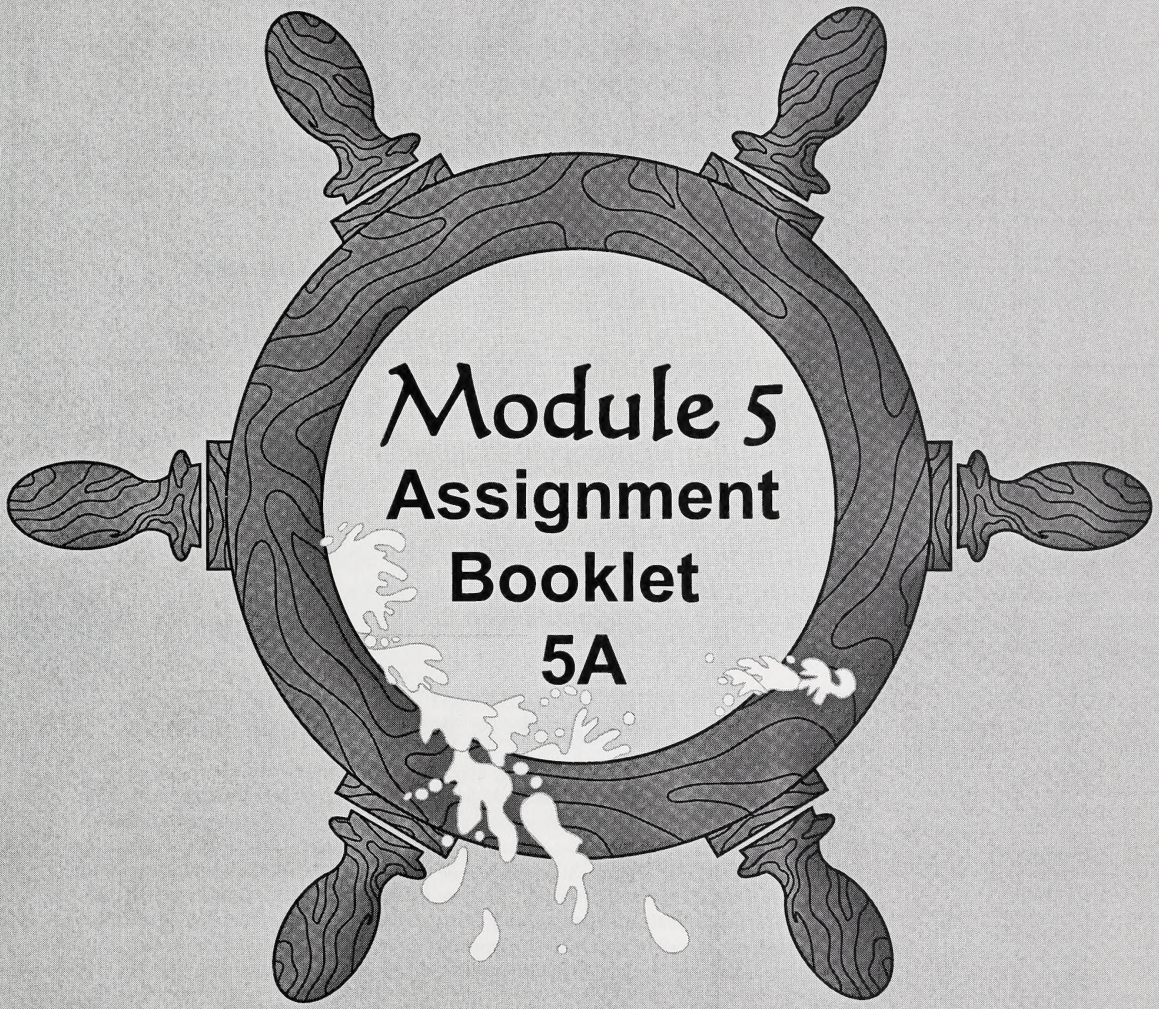
1. Assignment Booklets may be faxed. Contact your teacher for the fax number.

2. All faxing costs are the responsibility of the sender.

E-MAILING

Assignment Booklets may be e-mailed. Contact your teacher for the e-mail address.

Mathematics 5



Data Analysis

Learning
Technologies
Branch

Alberta
LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 1 Assignment	30	
Lesson 2 Assignment	30	
	60	

Teacher's Comments

Mathematics 5
Module 5: Data Analysis
Assignment Booklet 5A
Lesson 1 Assignment and Lesson 2 Assignment
Learning Technologies Branch

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

ASSIGNMENT BOOKLET 5A
MATHEMATICS 5—MODULE 5: DATA ANALYSIS

Your mark on this module will be determined by how well you do your assignments in the Assignment Booklets.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate lessons.

There are two lesson assignments in this Assignment Booklet. The total value of these assignments is 60 marks. The value of each assignment is stated in the left margin.

Be sure to proofread each assignment carefully.

30

Lesson 1 Assignment: Organizing and Displaying Data

1. Turn to page 148 of your textbook. Look at the bar graph in Starting Out. Give all of your answers for batting averages to the nearest hundredth.

(1) **a.** Which player had the best all-time batting average, and what was his approximate batting average?

(2) **b.** List the other six players and their batting averages in rank order, from greatest to least.

(2) **c.** How much lower was Carew's average than the best all-time batting average? Show your work.

2. Turn to page 146 of your textbook. Look at the line plot in the middle of the page. Answer all of the following questions and explain how you got each answer.

(1) **a.** How many students are represented by the data?

_____

_____

(1) **b.** What is the greatest number of books owned by any student?

_____

_____

(1) **c.** What is the most frequent number of books owned?

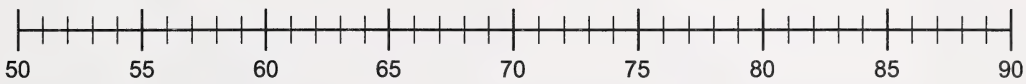
_____

_____

(2) **d.** Find the total number of books owned by all the students.

3. The members of the high school wrestling team were weighed. Their masses (in kilograms) are 65, 56, 77, 54, 54, 85, 70, 61, 63, 54, 65, 77, 61, 77, 72, 56, 54, 56, 61, 65, 56, 65, 77, 61, and 77.

(3) **a.** Show the masses of the wrestlers by labelling and completing the following line plot.



(3) **b.** In wrestling, opponents are matched based on their mass. Show the masses of the wrestlers by completing the following frequency diagram.

HIGH SCHOOL WRESTLING TEAM

Range of Masses (kg)	Tally	Number of Students
53–57		
58–62		
63–68		
69–74		
75–82		
83–90		

4. Turn to page 147 of your textbook. Look at the broken-line graph in the lower left corner.

a. What do the points on the graph tell you? (1)

_____

_____

b. Why do you think that a broken-line graph rather than a bar graph was used to display this data? (2)

_____

_____

_____

5. Turn to pages 153 and 154 of your textbook. Read about Three Throw Ball in On Your Own on page 153. Look at the table at the top of page 154. Answer all of the following questions and explain how you got each answer.

a. How many people played Three Throw Ball? (1)

_____

_____

b. How many people can throw the ball farther with their right arm than with their left arm? (1)

_____

_____

c. How many people can throw the ball farther with their left arm than with their right arm? (1)

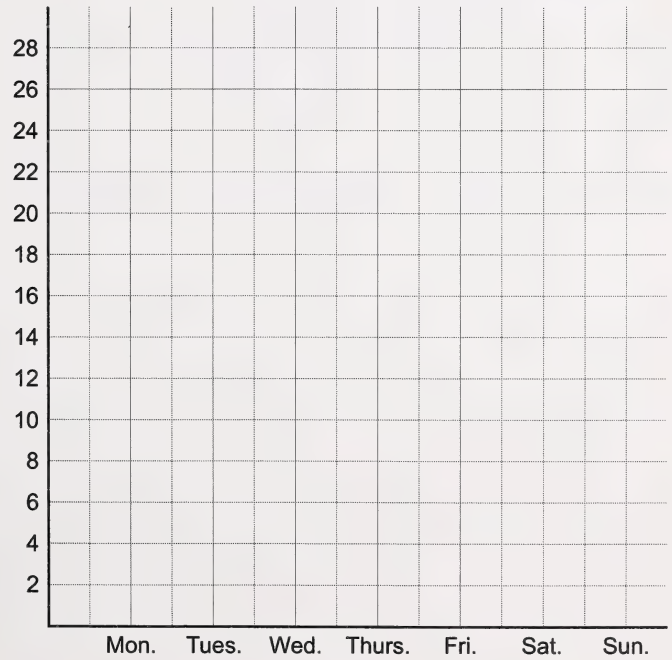
_____

_____

(2) **d.** Compare the three throws for each person. How does the throw each person made with both arms compare to the throws he or she made with just one arm?

(1) **e.** What information about the farthest throw does the data tell?

(3) **6. a.** Kalay practised every day of the week before the community track meet to prepare for the 100-m dash. Her times, in seconds, were Monday, 25; Tuesday, 23; Wednesday, 26; Thursday, 24; Friday, 22; Saturday, 20; and Sunday, 20. Label and complete a broken-line graph that shows Kalay's times through the week.



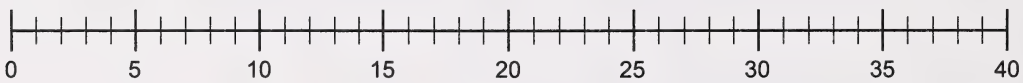
(2) **b.** Describe Kalay's progress over the week.

Lesson 2 Assignment: Selecting a Sample

(30) **1.** Five friends were comparing stories they had read about dinosaurs, and they wondered how long most dinosaurs were. Each person found the lengths of the 13 different dinosaurs. They put their data together to use as a single larger sample of 65 dinosaurs to answer their question.

Turn to pages 161 to 163 in your textbook. Each of the five tables shows the dinosaurs that were used in the sample. Use the data to answer questions 1.a. to 1.h.

(5) **a.** Label and complete a line plot for the combined sample of 65 dinosaurs.



(2) **b.** What is the most frequent length that appears in the sample? Explain.

(2) **c.** What is the least frequent length that appears in the sample? Explain.

(2) **d.** Which dinosaur in the sample is the longest, and what is its length?

(2) **e.** Which dinosaur in the sample is the shortest in length, and what is its length?

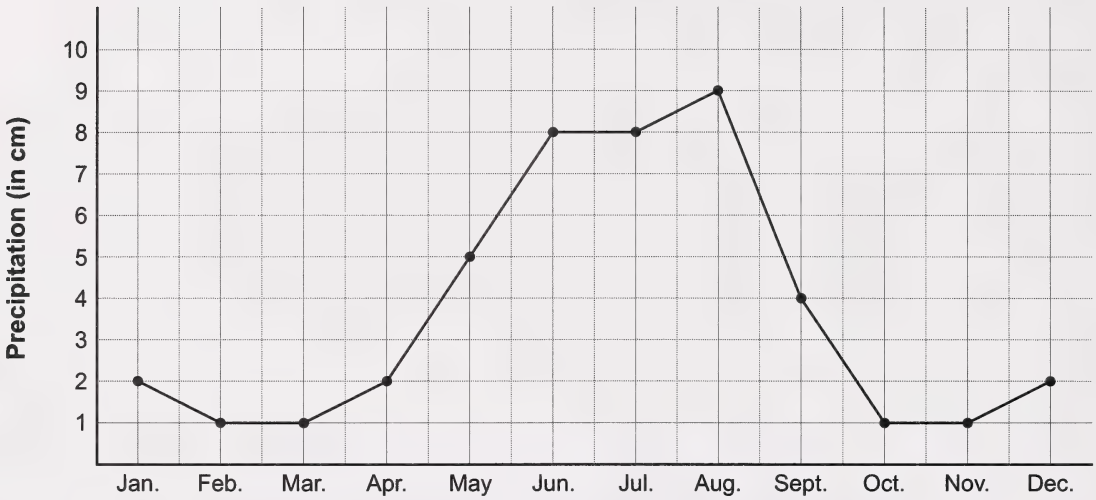
(3) **f.** In which of the five sets of data (represented by the five tables on pages 161 to 163), was there the greatest difference between the longest and the shortest dinosaur? Explain how you found your answer.

(2) **g.** How many of the dinosaurs are shorter in length than your kitchen table?

(2) **h.** How many of the dinosaurs are longer than the length of your house?

2. Use the following broken-line graph to answer questions 2.a. to 2.f.

AVERAGE PRECIPITATION FOR EDMONTON



(2) **a.** Which month has the greatest average precipitation and what is it?

_____

_____

(2) **b.** What is the least average precipitation? When does it occur?

_____

_____

(2) **c.** During which two consecutive months does Edmonton have the greatest average precipitation?

_____

_____

(2) **d.** During which two consecutive months does Edmonton have the least average precipitation?

_____

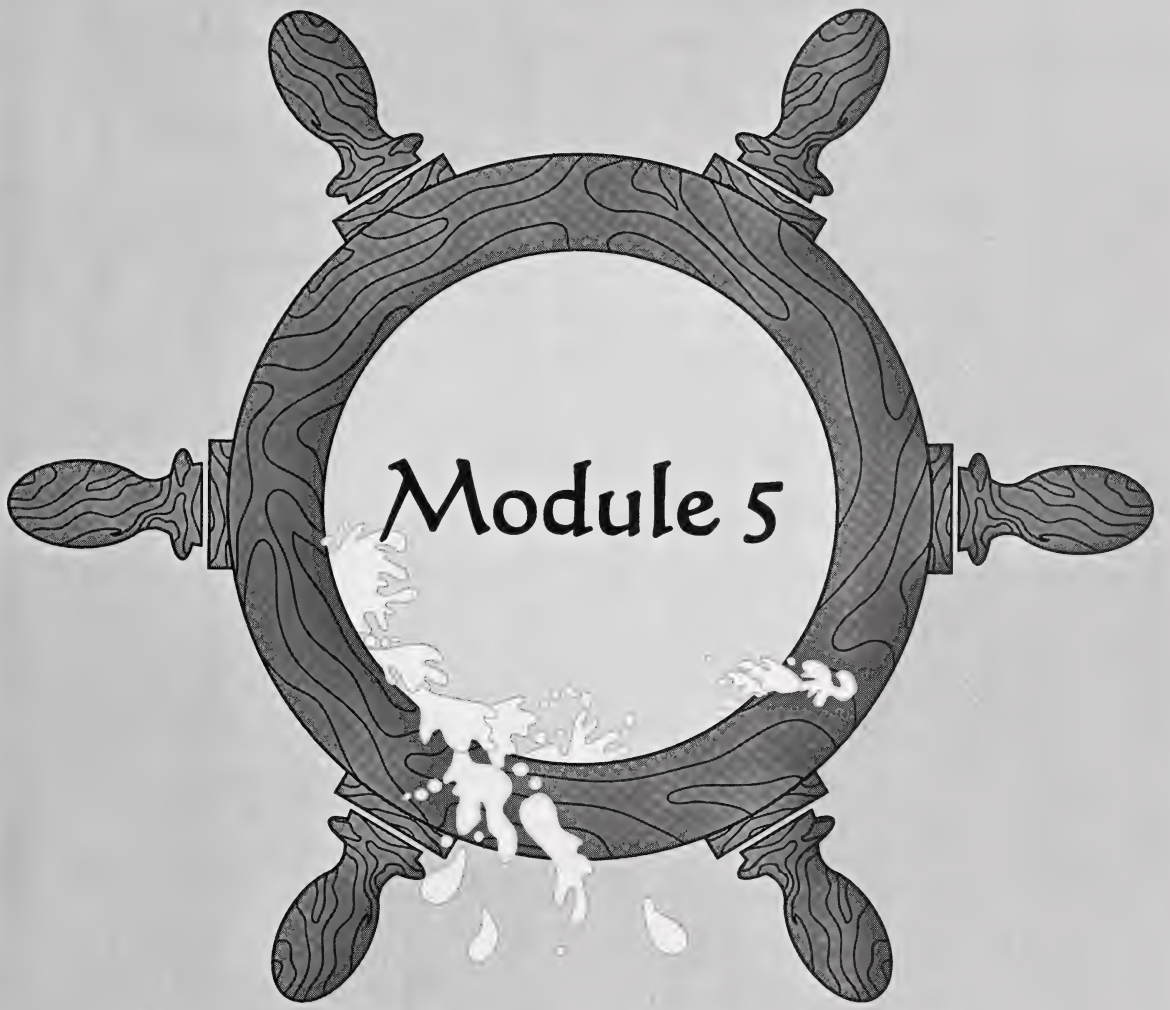
_____

(2) **e.** Between which two consecutive months is there the greatest change in average precipitation?

_____

_____

Mathematics 5



Home Instructor's Guide and Assignment Booklet 5B

Learning Technologies Branch

Alberta LEARNING

Mathematics 5
Module 5: Data Analysis
Home Instructor's Guide and Assignment Booklet 5B
Learning Technologies Branch
ISBN 0-7741-2040-1

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

Lesson 3: Collecting Data from Experiments

Overview

In Lesson 3 the student conducts experiments to answer questions. The student collects data and then displays it appropriately to answer the questions being investigated.

Special Requirements

You may collect the following materials for your student to use in this lesson:

- 3 cardboard tubes:
  - 28 cm long and 4 cm wide (Use a regular paper towel roll.)
  - 12.7 cm long and 4 cm wide (Cut down a regular paper towel roll.)
  - 12.7 cm long and 2.5 cm wide (Cut down a regular paper towel roll, slit it lengthwise, make the diameter smaller, and tape it.)
- metre-stick
- tape
- ruler
- coins: a penny, a nickel, a quarter, a loonie, and a toonie
- eyedropper
- glass of water
- paper towels
- 2 metre-sticks
- regular paper towel roll
- 10 base ten flats
- a small marble
- a large marble

Sharing Time

Students are asked to discuss what they are learning once in Lesson 3—at the end of Activity 2. This Sharing Time exercise is open-ended, so answers will vary. However, a sample response is given.

Activity 2 Sharing Time

When the height of the tube was raised, the marbles rolled farther. The distances increased by equal amounts when the end of the tube was raised by equal amounts.

The heavier marbles rolled farther than the lighter marbles for the same height of the tube.

These results are what you expect to happen.

ASSIGNMENT BOOKLET 5B

Mathematics 5
Module 5: Lesson 3 Assignment and Numbers in the News

Home Instructor's and Student's Comments:

STUDENT FILE NUMBER
(if label is missing or incorrect)

_____

Date Submitted:

_____

Apply Module Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and module.

FOR SCHOOL USE ONLY

Assigned Teacher:

_____

Date Assignment Received:

_____

Grading:

_____

Teacher's Comments

_____
Teacher's Signature

Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.

INSTRUCTIONS FOR SENDING IN THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you register for distance learning courses, you are expected to send in Assignment Booklets for corrections regularly. Try to send each Assignment Booklet as soon as you have completed it. Before sending your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to be sure the spelling and details are correct?
- Is the record form filled out and the correct module label attached?

MAILING

1. Postage Regulations

Do **not** enclose letters with Assignment Booklets.

Send all letters in a separate envelope.

2. Postage Rates

Take your Assignment Booklet to the post office and have it weighed. Attach enough postage and seal the envelope. Assignment Booklets will travel faster if correct postage is used and if they are in large envelopes that are no more than two centimetres thick.

FAXING

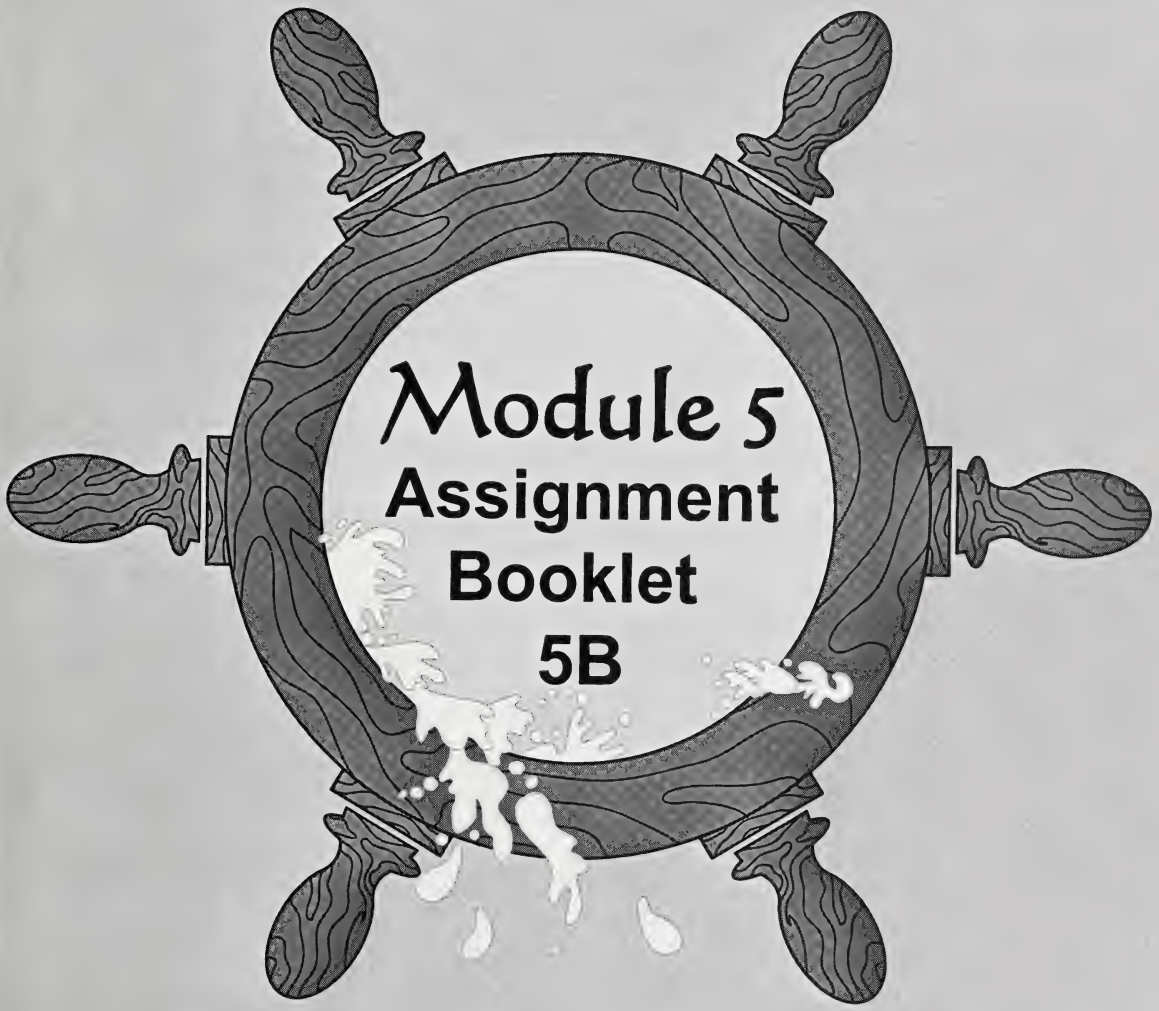
1. Assignment Booklets may be faxed. Contact your teacher for the fax number.

2. All faxing costs are the responsibility of the sender.

E-MAILING

Assignment Booklets may be e-mailed. Contact your teacher for the e-mail address.

Mathematics 5



Module 5
Assignment Booklet 5B

Data Analysis

Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 3 Assignment	30	
Numbers in the News	10	
	40	

Teacher's Comments

Mathematics 5
Module 5: Data Analysis
Assignment Booklet 5B
Lesson 3 Assignment and Numbers in the News
Learning Technologies Branch

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

ASSIGNMENT BOOKLET 5B
MATHEMATICS 5—MODULE 5: DATA ANALYSIS

Your mark on this module will be determined by how well you do your assignments in the Assignment Booklets.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate lessons.

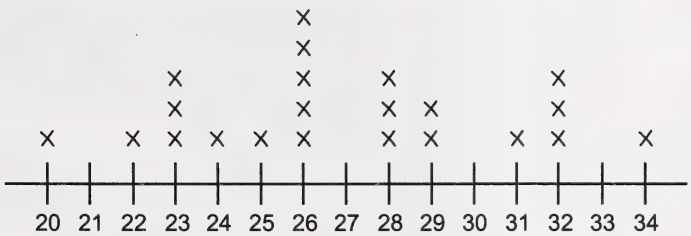
There is one lesson assignment and a Numbers in the News project in this Assignment Booklet. The total value of the lesson assignment is 30 marks. The Numbers in the News projects is worth 10 marks. The value of each assignment is stated in the left margin.

Be sure to proofread each assignment carefully.

30

Lesson 3 Assignment: Collecting Data from Experiments

A group of children timed how long it took each person to count aloud to 100 as quickly as he or she could. The results are shown in the following tables. Use the tables to answer questions 1 to 5.



Time (s)

Range of Time	Number of People
20–24	6
25–29	11
30–34	5

(2) **1.** What is the same about each representation of the data?

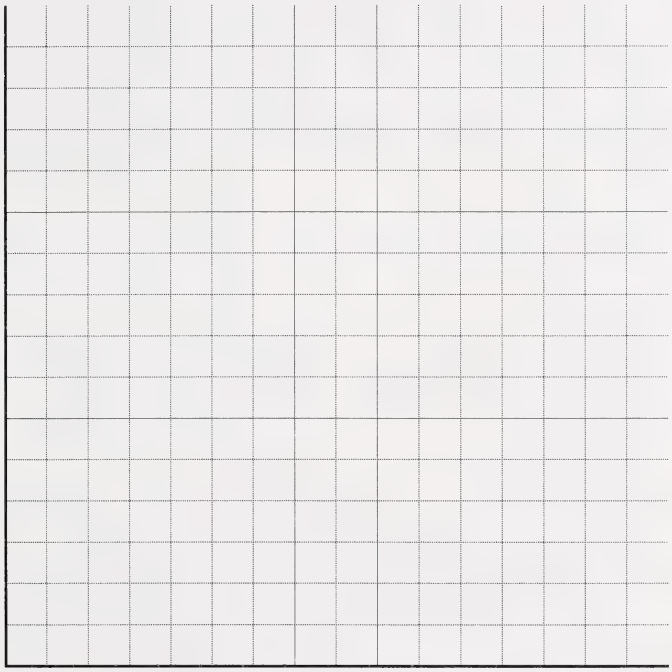
(2) **2.** What is different about each representation of the data?

(2) **3.** Does one display reveal the data better than the other? Explain.

(5) **4.** Reorganize the same data using the following ranges of time.

Range of Time (s)	Number of People
20–22	
23–25	
26–28	
29–31	
32–34	

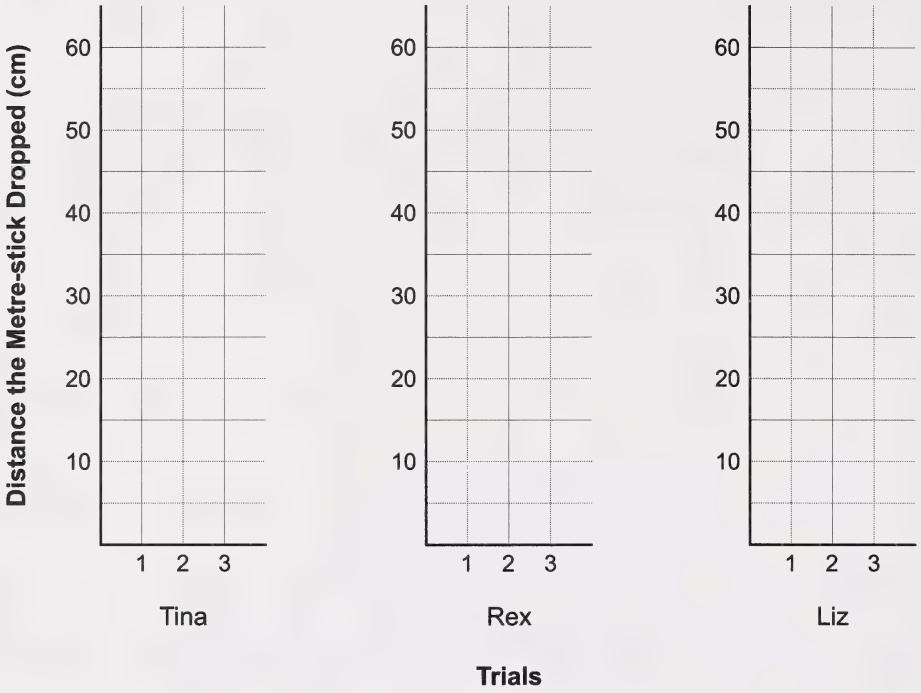
(3) **5.** Make a bar graph using the ranges in question 4. Label your work so that others can read your graph quickly and accurately.



Tina, Rex, and Liz are conducting reaction time experiments with a metre-stick. Each person gets three chances to see how quickly they catch the metre-stick after it is dropped. Their results are shown in the following table.

	Distance the Metre-stick Dropped (cm)		
Trial Number	**Tina**	**Rex**	**Liz**
1	50	17	20
2	40	26	22
3	15	23	59

(6) **6.** Make broken-line graphs to show how each person's reaction times changed over the three trials.



(2) **7. a.** Who has the best reaction time if the lowest number of centimetres on any trial wins?

_____

_____

(2) **b.** Who has the best reaction time if the high and low distances for each person are eliminated?

_____

_____

(2) **c.** Who has the best reaction time if the average distance for each person is calculated by adding their numbers and dividing by 3?

_____

_____

(2) **d.** Who has the best reaction time if the single lowest distance over the three trials wins?

(2) **8.** Read the claim that each person made, based on the results of the reaction time experiment.

- Tina claimed that by the end of the experiment, she was the quickest.
- Liz claimed that by not counting the high and the low distances, you are left with what would usually happen. She also claimed that she was the fastest.
- Rex claimed that his overall performance was most consistent.

Explain how the claims made by the different people show why you have to be so careful when interpreting statistics.

10

Numbers in the News

Go through the scavenger hunt list for Module 5 to make sure you have clipped at least one example for each question. Ask your home instructor to check the samples you found. Choose the sample you wish to use, and label each one with the scavenger hunt number it matches. Organize your samples and put them together with any other information required. Submit your project with this Assignment Booklet.

Ask yourself the following questions:

- Is my Numbers in the News project complete? (Have I included all my samples?)
- Do my samples show the ideas clearly? (Are my examples appropriate?)
- Did I take care to be neat when organizing and labelling my work?